

U.S. Census Bureau Urban Areas
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	8,000.0	3,088.8	188

Species Information

The columns below provide brief summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species	Abundance		Model		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential		
		Abundant	Common	Reliability	Adaptability	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT	
				High	20	RCP45	RCP85	Very Good	11	15	RCP45	RCP85
Ash	3			Medium	28	41	Increase	28	31	Good	16	15
Hickory	5			Low	25	10	No Change	7	9	Fair	9	10
Maple	3	Abundant	4	FIA	5		Decrease	25	20	Poor	11	9
Oak	14	Common	24				New	7	8	Very Poor	10	9
Pine	5	Rare	37				Unknown	7	6	FIA Only	3	3
Other	35	Absent	9							Unknown	2	1
	65		74		74	71		74	74		62	62
											14	19

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	59.8	61.7	63.7	63.8	
	CCSM85	59.8	61.9	64.4	67.3	
	GFDL45	59.8	62.8	64.9	65.7	
	GFDL85	59.8	62.7	66.0	69.7	
	HAD45	59.8	62.0	65.0	66.4	
HAD85	59.8	62.3	66.1	70.4		
Growing Season (May—Sep)	CCSM45	74.1	75.9	77.7	78.2	
	CCSM85	74.1	76.0	78.6	82.2	
	GFDL45	74.1	77.4	79.6	81.0	
	GFDL85	74.1	77.4	81.0	85.2	
	HAD45	74.1	76.9	79.6	81.4	
HAD85	74.1	76.9	81.8	86.5		
Coldest Month Average	CCSM45	38.6	40.8	41.7	41.7	
	CCSM85	38.6	40.9	41.8	43.2	
	GFDL45	38.6	42.0	42.3	43.0	
	GFDL85	38.6	40.9	41.8	42.9	
	HAD45	38.6	39.3	41.0	41.4	
HAD85	38.6	39.7	40.9	42.5		
Warmest Month Average	CCSM45	79.5	81.6	82.5	82.6	
	CCSM85	79.5	81.7	83.4	84.9	
	GFDL45	79.5	82.2	83.2	84.3	
	GFDL85	79.5	82.8	84.6	87.0	
	HAD45	79.5	82.6	84.4	85.1	
HAD85	79.5	83.2	86.3	89.1		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.7	50.9	53.1	54.6	
	CCSM85	45.7	51.3	54.4	61.2	
	GFDL45	45.7	50.0	54.6	57.4	
	GFDL85	45.7	49.7	56.0	57.2	
	HAD45	45.7	49.3	50.3	49.3	
HAD85	45.7	52.1	48.1	48.4		
Growing Season (May—Sep)	CCSM45	21.6	26.0	27.5	28.7	
	CCSM85	21.6	25.1	27.3	31.0	
	GFDL45	21.6	24.8	27.7	29.2	
	GFDL85	21.6	24.1	29.2	29.9	
	HAD45	21.6	23.4	23.1	22.9	
HAD85	21.6	25.6	22.7	21.3		

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

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Current and Potential Future Habitat, Capability, and Migration

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
loblolly pine	Pinus taeda	WDH	High	91.2	3173.9	37.4	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	90	1301.2	15.8	No change	No change	Medium	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	81.2	895.1	12.2	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
red maple	Acer rubrum	WDH	High	90	698.6	8.5	No change	No change	High	Abundant	Very Good	Very Good			1	4
white oak	Quercus alba	WDH	Medium	73.7	473.5	7.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	5
southern red oak	Quercus falcata	WDL	Medium	50	147.3	3.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	6
water oak	Quercus nigra	WDH	High	42.5	140.0	3.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
black cherry	Prunus serotina	WDL	Medium	50	131.9	3.1	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	8
pignut hickory	Carya glabra	WDL	Medium	41.2	114.8	3.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
northern red oak	Quercus rubra	WDH	Medium	41.2	108.1	3.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	10
blackgum	Nyssa sylvatica	WDL	Medium	60	103.2	1.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
sourwood	Oxydendrum arboreum	NDL	High	46.2	94.9	2.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	12
mockernut hickory	Carya alba	WDL	Medium	40	92.0	2.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
shortleaf pine	Pinus echinata	WDH	High	33.8	85.7	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
winged elm	Ulmus alata	WDL	Medium	26.2	80.1	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
American holly	Ilex opaca	NSL	Medium	41.3	80.1	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	16
American elm	Ulmus americana	WDH	Medium	32.5	79.9	3.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
flowering dogwood	Cornus florida	WDL	Medium	47.5	79.9	2.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	18
eastern redcedar	Juniperus virginiana	WDH	Medium	28.7	76.7	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
green ash	Fraxinus pennsylvanica	WSH	Low	20	76.3	3.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	30	75.1	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
black oak	Quercus velutina	WDH	High	38.7	74.9	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
river birch	Betula nigra	NSL	Low	18.8	72.1	3.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
willow oak	Quercus phellos	NSL	Low	27.5	68.4	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
scarlet oak	Quercus coccinea	WDL	Medium	31.3	67.9	2.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	25
swamp tupelo	Nyssa biflora	NDH	Medium	11.2	57.1	5.0	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	26
post oak	Quercus stellata	WDH	High	23.7	56.1	2.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
black willow	Salix nigra	NSH	Low	10	53.0	5.2	Sm. dec.	Sm. inc.	Low	Common	Poor	Fair			1	28
Virginia pine	Pinus virginiana	NDH	High	12.5	45.8	5.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	29
American beech	Fagus grandifolia	WDH	High	20	45.5	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	30
slippery elm	Ulmus rubra	WSL	Low	15	35.9	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
sycamore	Platanus occidentalis	NSL	Low	6.3	35.5	5.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	32
bald cypress	Taxodium distichum	NSH	Medium	1.2	32.1	25.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
laurel oak	Quercus laurifolia	NDH	Medium	6.2	31.8	5.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	34
longleaf pine	Pinus palustris	NSH	Medium	7.5	29.5	3.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
boxelder	Acer negundo	WSH	Low	2.5	28.6	11.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	1	36
pecan	Carya illinoensis	NSH	Low	12.5	22.6	4.5	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor			2	37
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	7.5	16.0	2.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	38
black walnut	Juglans nigra	WDH	Low	5	13.5	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
bitternut hickory	Carya cordiformis	WSL	Low	6.2	11.9	1.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	40
white ash	Fraxinus americana	WDL	Medium	11.2	11.3	1.0	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	41
water tupelo	Nyssa aquatica	NSH	Medium	1.2	10.0	7.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	42
common persimmon	Diospyros virginiana	NSL	Low	7.5	9.3	1.2	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	43
sweetbay	Magnolia virginiana	NSL	Medium	10	8.9	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	44
hackberry	Celtis occidentalis	WDH	Medium	2.5	8.7	3.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	45
red mulberry	Morus rubra	NSL	Low	7.5	8.5	1.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	46
blackjack oak	Quercus marilandica	NSL	Medium	5	8.2	1.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
swamp chestnut oak	Quercus michauxii	NSL	Low	5	6.8	1.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	48
eastern redbud	Cercis canadensis	NSL	Low	11.3	6.4	0.9	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	49
Shumard oak	Quercus shumardii	NSL	Low	2.5	6.0	2.3	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	50
white mulberry	Morus alba	NSL	FIA	1.2	5.5	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	51
sassafras	Sassafras albidum	WSL	Low	7.5	5.5	0.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	52
paulownia	Paulownia tomentosa	NSL	FIA	2.5	5.2	2.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
chestnut oak	Quercus prinus	NDH	High	1.2	5.1	4.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	54
shagbark hickory	Carya ovata	WSL	Medium	2.5	4.6	1.8	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	55
sweet birch	Betula lenta	NDH	High	1.2	3.3	2.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	56
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	7.5	2.8	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	57
florida maple	Acer barbatum	NSL	Low	1.2	1.9	1.5	No change	No change	High	Rare	Fair	Fair		Infill +	2	58
sugarberry	Celtis laevigata	NDH	Medium	1.2	1.1	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
slash pine	Pinus elliotii	NDH	High	1.2	1.1	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	60
pumpkin ash	Fraxinus profunda	NSH	FIA	1.2	1.0	0.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	61
northern catalpa	Catalpa speciosa	NSHX	FIA	1.2	0.8	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
American chestnut	Castanea dentata	NSLX	FIA	1.2	0.5	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
pawpaw	Asimina triloba	NSL	Low	1.2	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
serviceberry	Amelanchier spp.	NSL	Low	1.2	0.2	0.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	66
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	68
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	71
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	72
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	73
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	74